

Precautionary Notes Regarding Zinc And Iodine Supplementation

James P. Meschino, DC, MS

Back in 2001, the Age-Related Eye Disease Study (AREDS), a multi-center intervention trial involving 4,757 patients between the ages of 55 and 80 years old, showed that supplementation with antioxidants and zinc slowed the progression of macular degeneration. More specifically, in this study, conducted by the National Eye Institute (NEI), patients who were at high risk of developing more advanced stages of age-related macular degeneration (AMD) reduced their risk by approximately 25 percent when treated with a high-dose combination of vitamin C, vitamin E, beta-carotene and zinc. According to the NEI, this was the first treatment ever shown to successfully slow the progression of AMD.

Participants in the double-blind, placebo-controlled clinical study, each of whom suffered from varying degrees of AMD, were provided with one of four treatments: zinc alone, antioxidants alone, a combination of antioxidants and zinc, or a placebo. After an average of 6.3 years of treatment, results showed that taking zinc alone (80 mg per day, plus 2 mg of copper) or antioxidants alone (vitamin C - 500 mg, vitamin E - 400 IU, beta-carotene - 25,000 IU, daily dose) were effective interventions, but the best results occurred in those taking both antioxidant and zinc supplements at the above-described doses.

Since this study was published, a number of companies have formulated eye-care supplement products intended to slow the progression of macular degeneration. Many eye doctors recommend these supplements, which can be purchased without a prescription in drug stores and health food stores throughout North America, to their patients.

Health practitioners should realize that many of these eye-care supplements contain high doses of zinc. As such, you must be aware of the risk of zinc toxicity that may occur from additional zinc present in a multiple vitamin or other supplements, functional drinks or bars your patients may also be consuming.

There is great individual variation with respect to zinc intake that can initiate zinc toxicity. Evidence indicates that total zinc supplementation of 60 mg per day appears to be the lowest threshold level at which some people show signs of zinc toxicity, although many people can tolerate higher daily dosages. Supplements used to treat macular degeneration can contain up to 40-70 mg of zinc in the daily dosage. Therefore, it's important to be familiar with the signs and symptoms of zinc toxicity, particularly if you are recommending eye-care supplements and/or recommending supplements containing zinc.

Zinc Toxicity

Zinc toxicity can occur in both acute and chronic forms. Acute adverse effects of high zinc intake

include nausea, vomiting, loss of appetite, abdominal cramps, diarrhea, and headaches. One case report cited severe nausea and vomiting within 30 minutes of ingesting 4 g of zinc gluconate (570 mg elemental zinc). This scenario may occur in patients taking zinc lozenges to treat a sore throat.

Intakes of 150-450 mg of zinc per day have been associated with such chronic effects as low copper status, altered iron function, reduced immune function, and reduced levels of high-density lipoproteins. Reductions in a copper-containing enzyme, a marker of copper status, have been reported with even moderately high zinc intakes of approximately 60 mg/ day for up to 10 weeks.

Note that the doses of zinc used in the AREDS study (80 mg per day of zinc in the form of zinc oxide, administered for an average of 6.3 years) have been associated with a significant increase in hospitalizations for genitourinary causes, raising the possibility that chronically high intakes of zinc adversely affect some aspects of urinary physiology.

My suggestion is to encourage patients with macular degeneration to take an eye-care supplement that contains no more than 30 mg of zinc. In addition, I would recommend that the patient take a high-potency multiple vitamin and mineral supplement that contains an additional 15 mg of zinc and a B-50 complex, as well as 1,000 mg vitamin C, 400 IU vitamin E, 10,000 IU beta-carotene and 100 mcg selenium. This recommendation is based on the 2009 study (Christen WG, et al., *Archives of Internal Medicine*) that suggested B-vitamin supplementation reduces risk of macular degeneration by 34 percent in women with risk factors for heart disease. This effect was likely mediated by the ability of certain B vitamins (folic acid, vitamin B₁₂ and vitamin B₆) to lower homocysteine levels, which damages blood vessels, including vessels in and around the retina.

This supplementation approach will help guard against zinc toxicity while still supplying ample amounts of zinc therapeutically, and fortifies the eye with specific antioxidants and B vitamins that are important in preventing and managing macular degeneration and cataracts.

Radioactive Iodine Therapy and Kelp

A recent case study confirmed that patients receiving radioactive iodine to treat thyroid cancer should not take kelp or any form of iodine supplementation, and should be prescribed a low-iodine diet. Iodine from supplements (such as kelp) can compete with radioactive iodine for uptake by thyroid cells (and thyroid cancer cells), decreasing the effectiveness of the treatment. This also applies to patients being treated with radioactive iodine for Grave's disease.

This particular case, reported in January 2009, involved a 55-year-old man being treated for thyroid cancer who was instructed to follow a low-iodine diet as part of his treatment. However, his blood levels of iodine continued to increase. The researchers found that a selenium supplement he was taking contained kelp, a rich source of iodine, significantly increasing his iodine levels.

Resources

1. Institute of Medicine, Food and Nutrition Board. *Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc*. Washington, D.C.: National Academy Press, 2001.
2. Lewis MR, Kokan L. Zinc gluconate: acute ingestion. *J Toxicol Clin Toxicol*, 1998;36(1-2):99-101.
3. Hooper PL, Visconti L, Garry PJ, Johnson GE. Zinc lowers high-density lipoprotein-cholesterol levels. *J Am Med Assoc*, 1980;244:1960-1.

4. Johnson AR, Munoz A, Gottlieb JL, Jarrard DF. High dose zinc increases hospital admissions due to genitourinary complications. *J Urol*, 2007;177:639-43.
5. Christen WG, Glynn RJ, Chew EY, Albert CM, Manson JE. Folic acid, pyridoxine, and cyanocobalamin combination treatment and age-related macular degeneration in women: the Women's Antioxidant and Folic Acid Cardiovascular Study. *Archives of Internal Medicine*, February 2009;169(4):335-41.

MAY 2009